## *Amendments to the Claims*

The listing of claims will replace all prior versions, and listings of claims in the application.

1. (Currently Amended) A varactor diode, comprising:

   a substrate;

   a semiconductor nanowire, supported by said substrate, having a first conductivity type and having a region doped with a second conductivity type, wherein said nanowire has a length and a diameter thereby defining a[[n]] surface;

   an insulator formed on at least a portion of said surface;

   a first electrical contact formed on at least part of said insulator and coupled to said doped region; and

   a second electrical contact coupled to said nanowire, wherein an inversion layer is formed at a region at the surface of said nanowire and a depletion region is formed within said nanowire upon application of a voltage between said first and second electrical contacts, such that the varactor diode exhibits variable capacitance as a function of the applied voltage.

2. (Original) A circuit comprising a plurality of components, wherein at least one of said plurality of components is electrically coupled to the varactor diode of claim 1.

3. (Original) The circuit of claim 2, wherein the plurality of components and the varactor diode form a phase-shifter.

4. (Original) A circuit comprising a plurality of nanowires configured as the varactor diode of claim 1.

5. (Original) The varactor diode of claim 1, wherein said substrate is an insulating material, a semiconductor, a plastic or a ceramic.

6. (Original) The varactor diode of claim 1, wherein said first electrical contact is formed around a substantial portion of said insulator.

7. (Original) The varactor diode of claim 1, wherein said first conductivity type is P and said second conductivity type is N.

8. (Original) The varactor diode of claim 7, wherein said region is doped N+ type.

9. (Original) The varactor diode of claim 8, wherein said N+ type region is formed at an end of said nanowire.

10. (Original) The varactor diode of claim 1, wherein said first conductivity type is N and said second conductivity type is P.

11. (Original) The varactor diode of claim 10, wherein said region is doped P+ type.

12. (Original) The varactor diode of claim 11, wherein said P+ type region is formed at an end of said nanowire.

13. (Currently Amended) A method of making a varactor diode, comprising:

(a) ~~supporting~~ depositing a semiconductor nanowire, having a first conductivity type, on a substrate, wherein said nanowire has a length and a diameter thereby defining an surface;

(b) forming an insulator on at least a portion of the surface;

(c) doping a region of the nanowire with a second conductivity type material;

(d) forming a first electrical contact on at least part of the insulator and the doped region; and

(e) forming a second electrical contact on the nanowire, wherein an inversion layer is formed at a region at the surface of the nanowire and a depletion region is formed within the nanowire upon application of a voltage between the first and second electrical contacts, such that the varactor diode exhibits variable capacitance as a function of the applied voltage.

14. (Original) The method of claim 13, wherein the substrate is an insulating material, a semiconductor, a plastic or a ceramic.

15. (Original) The method of claim 13, wherein the first electrical contact is also formed on a substantial portion of the insulator.

16. (Original) The method of claim 13, further comprising removing a portion of the insulator to facilitate said doping of step (c).

17. (Original) The method of claim 16, further comprising removing a portion of the insulator from an end of the nanowire.

18. (Original) The method of claim 13, wherein the first conductivity type is P and the second conductivity type is N.

19. (Original) The method of claim 18, wherein the region is doped N+ type.

20. (Original) The method of claim 13, wherein the first conductivity type is N and the second conductivity type is P.

21. (Original) The method of claim 20, wherein the region is doped P+ type.

22. (Original) A method of making a varactor diode, comprising:

(a) depositing a semiconductor nanowire on a substrate, the nanowire having a first conductivity type core and an insulating shell;

(b) doping a region of the nanowire with a second conductivity type material;

(c) forming a first electrical contact on at least part of the insulator and the doped region; and

(d) forming a second electrical contact on the nanowire, wherein an inversion layer is formed at a region at the surface of the nanowire and a depletion region is formed within the nanowire upon application of a voltage between the first and second electrical contacts, such that the varactor diode exhibits variable capacitance as a function of the applied voltage.

23. (Original) The method of claim 22, wherein the substrate is an insulating material, a semiconductor, a plastic or a ceramic.

24. (Original) The method of claim 22, wherein the first electrical contact is formed on a substantial portion of the insulator.

25. (Original) The method of claim 22, further comprising removing a portion of the insulator to facilitate said doping of step (b).

26. (Original) The method of claim 25, further comprising removing a portion of the insulator from an end of the nanowire.

27. (Original) The method of claim 22, wherein the first conductivity type is P and the second conductivity type is N.

28. (Original) The method of claim 27, wherein the region is doped N+ type.

29. (Original) The method of claim 22, wherein the first conductivity type is N and the second conductivity type is P.

30. (Original) The method of claim 29, wherein the region is doped P+ type.

31. (Original) A method of making a varactor diode, comprising:

(a) depositing a semiconductor nanowire on a substrate, the nanowire having a first conductivity type core, an insulating shell, and a conductor layer surrounding the shell;

(b) doping a region of the nanowire with a second conductivity type material;

(c) forming a first electrical contact on the conductor layer and the doped region; and

(d) forming a second electrical contact on the nanowire, wherein an inversion layer is formed at a region at the surface of the nanowire and a depletion region is formed within the nanowire upon application of a voltage between the first and second electrical contacts, such that the varactor diode exhibits variable capacitance as a function of the applied voltage.

32 (Original) The method of claim 31, wherein the substrate is an insulating material, a semiconductor, a plastic or a ceramic.

33. (Original) The method of claim 31, wherein the first electrical contact is formed on a substantial portion of the insulator.

34. (Original) The method of claim 31, further comprising removing a portion of the insulator and the conductor layer to facilitate said doping of step (b).

35. (Original) The method of claim 32, further comprising removing a portion of the insulator from an end of the nanowire.

36. (Original) The method of claim 31, wherein the first conductivity type is P and the second conductivity type is N.

37. (Original) The method of claim 36, wherein the region is doped N+ type.

38. (Original) The method of claim 31, wherein the first conductivity type is N and the second conductivity type is P.

39. (Original) The method of claim 38, wherein the region is doped P+ type.

40. (New) A varactor diode, comprising:

a substrate;

a semiconductor nanowire having a solid core, supported by said substrate, having a first conductivity type and having a region doped with a second conductivity type, wherein said nanowire has a length and a diameter thereby defining an surface;

an insulator formed on at least a portion of said surface;

a first electrical contact formed on at least part of said insulator and coupled to said doped region; and

a second electrical contact coupled to said nanowire, wherein an inversion layer is formed at a region at the surface of said nanowire and a depletion region is formed within said nanowire upon application of a voltage between said first and second electrical contacts, such that the varactor diode exhibits variable capacitance as a function of the applied voltage.